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| 09/704,359 | 11/01/2000 | Truong-Thao Nguyen | 10991132-1 | 4751 |

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EXAMINER

LE, BRIAN Q

| ART UNIT | PAPER NUMBER |
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2623

DATE MAILED: 01/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/704,359

Applicant(s)

NGUYEN, TRUONG-THAO

Examiner

Brian Q Le

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 8 and 10-23 is/are rejected.
- 7) ☒ Claim(s) 6 and 9 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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Claim Rejections - 35 USC § 112

1. Claims 7-8, 15, 20, and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The term “luminance curvature value” is not clearly understood by one skilled in the art. The applicant is required to explain this concept clearly in the claim and in the specification.

2. Claims 7-8, 15, 20, and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The term “luminance curvature value” is not clearly understood by one skilled in the art. The applicant is required to explain this concept clearly in the claim and in the specification.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3, 7-8, and 10-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Le U.S. Patent No. 6,608,942.

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Regarding claim 1, Le teaches a method of detecting edges (abstract) of features in digital images comprising:

Computing a first luminance characteristic (pixel value or brightness of pixel) of a selected region of an input digital image (column 3, lines 20-25);

Computing a second luminance characteristic of said selected region of said input digital image, said first and second luminance characteristics being related to variations of luminance values within said selected region (Le teaches the determination of luminance for plurality of zones. Thus, there must be a computation for first and second luminance characteristic) (column 3, lines 20-45; FIG. 6A); and

Determining whether either one of said first and second luminance characteristics exceeds a predefined threshold, which is indicative of a presence of an edge of a feature in said selected region of said input digital image (FIG. 6C and FIG. 11).

Regarding claim 2, Le also teaches the method wherein said step of computing said first luminance characteristic includes computing a two-dimensional luminance gradient value for said selected region of said input digital image (it is well know for one skilled in the art that gradient is a two-dimensional vector of derivative values in each of the x and y direction) (Table 2 and column 10, lines 60-67).

For claim 3, Le discloses the method wherein said step of computing said two dimensional luminance gradient value includes using a vertical gradient mask (vertical gradient rule/equation/condition) and a horizontal gradient mask (horizontal gradient rule/equation/condition) to derive said two-dimensional luminance gradient value (Table 2 and column 10, lines 60-67).

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Regarding claim 7, Le teaches the method wherein said step of computing said second luminance characteristic includes computing a two-dimensional luminance curvature value for said selected region of said input digital image (FIG. 10A and column 19, lines 13-18).

For claim 8, Le further teaches the method wherein said step of computing said two-dimensional luminance curvature value includes using a vertical curvature mask and a horizontal curvature mask to derive said two-dimensional luminance curvature value (TABLE 2 and column 10, lines 5-67).

Regarding claim 10, Le further teaches the method further comprising a step of determining whether the maximum luminance value of said selected region of said input digital image exceeds a predefined luminance threshold (FIG. 17C).

Referring to claim 11, Le discloses the method further comprising a step of determining whether the maximum chrominance value (gradient value of color component of the pixel) (FIG. 6A, 6B and 6C) of said selected region of said input digital image exceeds a predefined chrominance threshold.

For claim 12, Le further teaches the method further comprising a step of counting the number (the step of determine edge data from 1 or more color components) of chrominance values within said selected region of said input digital image that exceeds a predefined chrominance threshold (FIG. 6A, 6B and 6C).

Regarding claim 13, please refer to claim 1 for the explanation. Note, when one skilled in the art computes/determines/calculates the luminance characteristic, it would be the mean of filtering the luminance characteristic.

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Regarding claims 14 and 15, please refer back to claims 2 and 7 respectively for the explanation.

For claim 16, please refer back to claims 1 and 10 for the explanation.

For claim 17, please refer back to claim 1 and 11 for the explanation.

Regarding claim 18, please refer back to claim 1 for the explanation. In addition, Le teaches the method of extracting the maximum luminance value (FIG. 17C, element 1752) from said selected region of said input digital image; and comparing said first luminance characteristic and said maximum luminance value to corresponding thresholds to determine whether said selected region of said input digital image includes an edge of a text (FIG. 6C and FIG. 11).

Regarding claim 19, please refer back to claim 2.

Regarding claim 20, Le discloses the method wherein said step of computing said first luminance characteristic includes computing a two-dimensional luminance curvature value for said selected region of said input digital image (FIG. 10A and column 19, lines 13-18).

Regarding claim 21, please refer back to claim 1 for the explanation.

For claim 22, please refer back to claim 7 for the explanation.

Regarding claim 23, please refer back to claim 11 for the explanation.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Le U.S. Patent No. 6,608,942 as applied to claim 3 above, and further in view of Mancuso U.S. Patent No. 5,870,495.

For claim 4, Le discloses that prior art use a step of applying a low-pass noise filter to said selected region of said input digital image (column 1, lines 42-43). In addition, Mancuso teaches the method of detecting edge of image (column 5, lines 10-15) utilizing low-pass noise filter (column 6, lines 40-43). Modifying Le's method of detecting edge according to Mancuso would be able to filter the noise from the image. This would improve processing and therefore, it would have been obvious to one of ordinary skill in the art to modify Le according to Mancuso.

Regarding claim 5, Mancuso further teaches a 3 x 3 matrix is utilized to filter the noise (column 5, lines 57-67 and column 6, lines 1-8). It would have been obvious for one skilled in the art to utilize a similar 3 x 3 matrix with different coefficients as a design choice to filter the noise from an image. Therefore, it is obvious for one skilled in the art to modify Mancuso's method of detecting edge with 3 x 3 matrix noise filter with a similar 3 x 3 noise filter with different coefficients.

Allowable Subject Matter

7. Claims 6 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

CONCLUSION

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8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to edge detection, luminance, and chrominance comparisons:

U.S. Pat. No. 5,768,438 to Etoh, teaches Image Encoding/Decoding Device.

U.S. Pat. No. 5,946,420 to Noh, teaches printing with text enhancement, recognition by sensing paired edges, or by disqualification in pictorial regions.

U.S. Pat. No. 6,535,221 to Allen, teaches image enhancement method and apparatus for internet printing.

U.S. Pat. No. 5,920,356 to Gupta, teaches coding parameter adaptive transform artifact reduction process.

U.S. Pat. No. 6,408,109 to Silver, teaches apparatus and method for detecting and sub-pixel location of edges in a digital image.

U.S. Pat. No. 6,252,985 to Mitsunaga, teaches image detecting apparatus.

U.S. Pat. No. 5,822,469 to Silverstein, teaches Post-filter for improving halftone image sharpness.

U.S. Pat. No. 5,852,475 to Gupta, teaches transform artifact reduction process.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Q Le whose telephone number is 703-305-5083. The examiner can normally be reached on 8:30 A.M - 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to TC Customer Service whose telephone number is 703-306-0377.

BL
December 19, 2003



SAMIR AHMED
PRIMARY EXAMINER